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Work ability impairment and facets of workplace perception are predictive for sick leave duration in persons with work-anxiety

Arbeitsfähigkeitsbeeinträchtigung und Aspekte der Arbeitsplatzwahrnehmung sind Prädiktoren für die Arbeitsunfähigkeitsdauer bei Menschen mit Arbeitsängsten

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Zusammenfassung

Menschen mit Arbeitsängsten haben ein ausgeprägtes Risiko für Langzeitarbeitsunfähigkeit und damit verbunden hohen Kosten für ihre Berufsbiographie und für Unternehmen. Diese Längsschnittstudie untersucht bei 103 Menschen mit Arbeitsängsten subjektive Arbeitsplatzwahrnehmung (KFZA) und objektive Arbeitsfähigkeitsbeeinträchtigung (sozialmedizinische Beobachterratings mittels Mini-ICF-APP) im Hinblick auf ihre prädiktive Wertigkeit für die Dauer der nachfolgenden Arbeitsunfähigkeit. Stärkere Arbeitsfähigkeitsbeeinträchtigung (Mini-ICF-APP) war vorhersagewertig für längere Arbeitsunfähigkeitsdauer innerhalb der nächsten sechs Monate. Darüber hinaus zeigte sich Arbeitswahrnehmung (KFZA) zusätzlich varianzaufklärend für die Arbeitsunfähigkeitsdauer. Training und Wiedereingliederungsbemühungen sollten sich bei Menschen mit Arbeitsängsten auf die Arbeitsfähigkeit konzentrieren, sowie die subjektive Wahrnehmung (v.a. Handlungsspielraum, sozialer Rückhalt, Kooperationsnotwendigkeit) der Arbeit mitberücksichtigen.

Schlüsselwörter: Arbeitsangst, Wiedereingliederung, Arbeitsunfähigkeit, psychische Gesundheit, Arbeitswahrnehmung

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Abstract

Persons with work-anxiety are on risk for long-term sick leave and cause high costs for society, companies and their own work biography. Understanding psychological return-to-work-predictors is important for early reintegration of these persons into the work context. This longitudinal study for the first time investigates the predictive value of workplace perception and objective work ability impairment for future sick leave duration in work-anxiety persons.

The investigation was done in 103 persons with work-anxieties. These persons were in working age and confronted with return to work after somatic illness. Work ability impairment was assessed in a structured interview by a state-licensed socio-medical specialist using the established Mini-ICF-APP. Participants filled in a questionnaire on their workplace perception (KFZA). Degree of work ability impairment (Mini-ICF-APP) was predictive for longer sick-leave, as well as workplace perception (KFZA dimensions scope of action, social support, need for cooperation).

Training and return-to-work-support in persons with work-anxiety should focus on both the work ability impairment, and on workplace perception.

Keywords: Work-anxiety, return to work, sick leave, mental disorders, work ability, workplace perception, job control

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Work ability impairment and workplace perception are predictive for sick leave duration in persons with work-anxiety

The longer the sick leave duration, the higher the risk for ending up in early retirement (Brouwers, Terluin, Tiemens, & Verhaak, 2009; Hunt, 2005). A special risk group for long-term sick leave are persons with mental disorders[1] (Gjesdal, Ringdal, Haug, & Maeland, 2008; Soegaard, 2012), and especially with high levels of anxiety and fear avoidance (Brouwers et al., 2009; Roelen et al., 2012; Verdonck-de Leeuw, van Bleek, Leemans, & de Bree, 2010), or even specific work-anxieties (Muschalla & Linden, 2009). Not only clinical samples, but also the general working population must be considered: In a sample of working employees *who have not been in treatment for mental disorders*, 5% are prone to go on sick leave due to work-phobic avoidance tendencies (Muschalla, Heldmann, & Fay, 2013).

Work-anxiety is a concept of clinical origin with essential relevance for work- and organizational psychology, due to its specific negative consequences: sick leave and productivity losses (Muschalla & Linden, 2013). Work-anxiety is defined as anxiety which is specifically related to work in general, or a specific current or past workplace, work situation or work duties (Muschalla & Linden, 2009, 2013). Research on work-anxiety has shown that work-anxiety can be empirically distinguished from general mental disorders (e.g. Muschalla & Linden, 2009). Persons with work-anxiety are significantly longer on sick leave (24 weeks, Muschalla & Linden, 2009) than persons with anxiety disorders (16 weeks). Persons with work-anxiety report or even show observable physiological arousal when thinking of the

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workplace or specific work situations (Haines, Williams, Carson, 2002; Macovei, 2016; Mannor, Wowak, Bartkus, & Gomez-Meija, 2016; Payne, Fineman, & Jackson, 1982, Srivastava & Sen, 1995). Empirical research shows that persons with work-anxiety perceive their workplace more negatively than other persons do (even persons with general mental disorders, Muschalla, Fay, & Linden, 2016). As persons may rather speak about their workplace (i.e. report their workplace perception) instead about their feelings at work (work-anxiety), exploring workplace perception may be a fruitful way to start solution-oriented interaction with work-anxiety-employees (Muschalla, 2017). In sum, persons with work-anxiety are an important group at risk and in need of specific investigation.

In order to find the target points for interventions for shortening sick leave durations in these persons with work-anxieties, it is first of all necessary to identify the factors that contribute to prolonged sick leave durations. Sick leave is a socio-medical status which must be certified by a physician after a thorough clinical examination. According to the German sick leave guidelines (GBA[2], 2014) sick leave is given to a person in case her/his work ability is reduced due to physical or mental illness, and s/he therefore cannot fulfill his/her work duties, or (in case of an unemployed) cannot continue efforts of job application. The person on sick leave may stay away from work for a defined period of time and does not have financial losses. In scientific research, work ability is consensually understood as a concept considering interaction of person and work factors (Lederer, Loisel, Rivard, & Champagne, 2014), i.e. a type of person-job/role-fit (French, 1973). Work disability or sick leave results from complex and individual interactions of *illness-related work ability impairment* (and not directly from

[1] Epidemiology has shown consistently over the decades that 30% of the general (i.e. also working) population suffer from any mental disorders.
[2] GBA = Gemeinsamer Bundesausschuss. The G-BA is the highest decision-making body of the common self-administration of physicians, psychotherapists, hospitals and health insurances in Germany.

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symptoms, e.g. Gatchel, Polatin, Mayer, & Garcy, 1994) on the one hand, and *workplace aspects* on the other hand. Beyond the importance of observable work ability (Arends et al., 2010; Hatchard, Henderson, & Stanton, 2012; Linden, Baron, & Muschalla, 2010; Nielsen et al., 2013), also the cognitive level of workplace perception must be taken into consideration.

In research until now, the job-demand-control approach (Karasek & Theorell, 1990) and the job-demand-resources approach (Bakker & Demerouti, 2007) have been applied for questions of mental health and work. It has been found that high job demands and low job control are related with mental health problems (Stansfeld & Candy, 2006), e.g. depression was related with the perception of high job demands (Rau et al., 2010). Also demands like workload or problems with reorganisation were associated with absenteeism (Bakker, Demerouti, DeBoer, & Schaufeli, 2003). *The Short Questionnaire for Work Analysis* (KFZA, Prümper, Hartmannsgruber, & Frese, 1995) as an internationally established tool for work description covers a range of workplace characteristics. The KFZA dimensions can be grouped as rather representing aspects of *job demands* (qualitative and quantitative stress, need for cooperation, interruptions and situational constraints, environmental stress), or aspects of *job resources* (variability, social support, participation, benefits, holistic job, scope of action). Research shows that persons with work-anxiety have a significantly more negative workplace perception than others. This is right for almost all workplace characteristics, i.e. scope of action, holistic job, social support, need for cooperation, qualitative and quantitative stress, interruptions and situational constraints, environmental stress, information and participation, as measured with the *Short Questionnaire for Work Analysis* (KFZA, in Muschalla, Fay, & Linden,

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2016).

But beyond, it is until now still unclear whether and which aspects of workplace perception might be *explanative for the further sick leave* in persons with work-anxiety. For employers, work council, and company doctors it is important to know whether there are psychological return-to-work predictors which can be influenced both in the person or in the work context. Their interest is especially in which way workplace perception contributes to sick leave durations in persons with work-anxieties, because their field of intervention is the work context (e.g. work hazard analysis and work adjustment) rather than the symptom level (e.g. symptom-oriented interventions).

Empirical state of the art on return to work predictors

Past research on return-to-work focused on *socio-demographic, medical* as well as *psychological factors*: Gender was not consistently associated with return-to-work (Blank, Peters, Pickvance, Wilford, & MacDonald, 2008; Cornelius, van der Klink, Groothoff, & Brouwer, 2011; De Rijk, Janssen, Alexanderson, & Nijhuis, 2008; Gjesdal et al., 2008; Nielsen et al., 2012; Roelen et al., 2012), but there are hints that younger age is a positive predictor for return-to-work (Cornelius et al., 2011; Roelen et al., 2012, Huijs, Koppes, Taris, & Blonk, 2012; Dekkers-Sánchez, Hoving, Sluiter, & Frings-Dresen, 2008). Furthermore, the longer a person has been on sickness absence from work in the past, the more difficult or even impossible is the return to work (Cornelius et al., 2011; Dekkers-Sánchez et al., 2008; Hees, Koeter, & Schene, 2012; Koopmanns et al., 2010, 2011; Nielsen et al., 2011).

Also *illness- and work ability predictors* have largely been researched: It

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is known that mental disorders more than somatic illness are associated with delayed return to work (Blank, Peters, Pickvance, Wilford, MacDonald, 2008; Cornelius et al., 2011; De Rijk et al., 2008; Gjesdal et al., 2008; Hoedeman, Krol, Blankenstein, Koopmans, & Groothoff, 2010; Nielsen et al., 2011, Soegaard, 2012). The mean time to return-to-work in persons with mental disorders is about half a year (Nielsen et al., 2012). The longer persons are on sick leave, the lower the probability for successful return-to-work within six months, and only 50 % of those who are off from work for six months or longer return to work (Brouwers, Terluin, Tiemens, & Verhaak, 2009; Hunt, 2005). Finally, return-to-work is also predicted by psychological factors (Hees et al., 2012; Cornelius et al., 2011; Huijs et al., 2012; Nielsen et al., 2011; Nieuwenhuijsen, Noordik, van Dijk, & van der Klink, 2013; Berglind & Gerner, 2003; Heijbel, Josephson, Jensen, Stark, & Vingård, 2006). Different work ability aspects like problem solving, self-management, or interaction with colleagues or supervisors are important for return-to-work (Hatchard, Henderson, & Stanton 2012; Arends et al., 2010; Nielsen et al., 2013).

The perceived *workplace perception* is important for return to work as well. Empirical findings show that employees with the perception of high work pace demands and high workload report a lower self-efficacy to return to work (Nieuwenhuijsen, Noordik, van Dijk, & van der Klink, 2013). Similarly, perceived low social support (which to cope with is a kind of demand) has been found to be a hindrance factor for return to work (Ekberg, Wahlin, Persson, Bernfort, & Öberg, 2015; Silva-Junior & Fischer, 2014). Anxiety may due to its phenomenology (Muschalla & Linden, 2013) be related with demand or control perception: Work-anxiety thus may be higher when high job demands are

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perceived, while it may be lower when the person has a feeling of job control. A perception of high job control may contribute to overcoming work-anxiety and avoidance and thus may be followed by shorter sick leave duration. Until now, we know from two independent studies (Muschalla et al., 2016; Muschalla, 2017) that work-anxiety is going along with more negative workplace perception. These studies however reported cross-sectional data, and they showed that there is a relationship between work-anxiety and workplace perception and earlier sick leave. There is until now no knowledge whether workplace perception also has a predictive value for the further sick leave duration over the next six months. The present research question is thus whether the workplace perception is an *additional predictive factor* for future sick leave duration. Findings will give hints whether workplace perception is worth to be considered in return-to-work-processes in cases of work-anxiety.

Aim of the study and question of research

The study follows two innovative aims going beyond the presently known illness- and work ability-related sick leave predictors: First, this study examines for the first time the additional predictive value of *workplace perception* for further sick leave duration, considering various workplace dimensions (KFZA). Second, the study focuses on the important group of persons with *work-anxiety,* i.e. persons who especially endangered for long-term sick leave (Muschalla & Linden, 2009).

Research has shown that workplace perception seems to be a relevant cognitive component associated with work-anxiety and earlier sick leave (Muschalla et al., 2016; Muschalla, 2017). The assumption of this study is that aspects of workplace perception -

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beside observable work ability (impairments) - may also have additional explanative value for future sick leave duration.

Hypothesis: In persons with work anxiety, workplace perception has an additional explanative value for future sick leave duration (beyond the illness-related work ability predictors: work ability impairment and physicians work ability prognosis).

Since the field of research is very origin (there is no earlier research on workplace perception and further sick leave in persons with work-anxiety), no directed hypotheses can be formulated concerning *which* workplace characteristics may be of specific importance.

Additional explorative question of research: In case workplace perception has explanative value for later sick leave duration, it is of explorative interest which aspects of workplace perception – whether workplace dimensions rather reflecting job demands or job resources - appear as significant predictors.

Method

Study setting and procedure

This is a longitudinal study. We investigated persons with work-anxiety on their work ability and workplace perception. The persons were surveyed while staying in a somatic rehabilitation and awaiting return to work. Six months later, participants were asked for their sick leave duration[3].

[3] This study is a part of a larger research project which included a work-anxiety-coping-intervention. The results of this randomized controlled therapy intervention are reported elsewhere (Muschalla, Linden & Jöbges, 2016; Muschalla, 2016) and show that a work-coping-intervention leads to better work-outcome than a recreational intervention.

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This study focuses *persons with work-anxieties*, as these persons are most in risk of long term sick leave and are very costly in the professional setting (Muschalla & Linden, 2009; Smith, 2009). Work-anxiety may occur in any professional field (e.g. Muschalla & Linden, 2013; Fehm & Schmidt, 2006; Payne et al., 1982). For investigations, heterogeneous persons with work-anxiety from various professional fields can be found in rehabilitation clinics (beside other settings). The aim of rehabilitation is to restore and improve work ability and if possible initiate return-to-work. In a three weeks routine rehabilitation care, participants get medical treatments directed to their specific health condition, and health-behavior-oriented education trainings.

In live interviews, we investigated unselected rehabilitation participants in working age (24–63 years old), who were medically ready for return to work after neurologic, orthopedic and cardiology treatment. All patients of this kind got a date for the study interview in their rehabilitation time schedule and were accordingly approached consecutively by an experienced socio-medically trained psychotherapist and researcher. The persons were investigated three days after admission into the rehabilitation center, i.e. before treatments started. The interview and assessment was stepped: The persons were first asked standardized work-anxiety screening questions (from the *Job-Anxiety-Scale*, Muschalla & Linden, 2013). Those who reported work-anxiety in two out of nine screening questions were further investigated in a structured diagnostic interview on the type of work-anxiety (*Work-Anxiety-Interview*, Linden & Muschalla, 2007) and work ability impairment (*Mini-ICF-APP*, Linden, Baron, & Muschalla, 2009). The decision whether a person got a work-anxiety diagnosis or not was done according to the criteria of the Work-Anxiety-Interview. After the interview, participants were asked to fill in a self-rating questionnaire on their workplace perception (*KFZA*, Prümper, Hartmannsgruber, & Frese, 1995). Independent socio-medical judgment of participants´

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work ability prognosis was given by the treating physician.

Participants were informed about the content of the study and that the data were analysed statistically for scientific purposes only. Participants filled in the questionnaire voluntarily and anonymously with written informed consent. There were no presents or payment.

Six months after discharge participants were contacted again and asked for their sick leave duration within the six months after rehabilitation. Table 1 summarizes the study design.

[insert table 1 about here]

Participants

From initially interviewed 709 persons, 297 had higher scores in the work-anxiety screening and 184 agreed to further participate in the study and do the additional Work-Anxiety-Interview. 22 of the 184 (12%) did not get a diagnosis of work-anxiety in the interview. The 162 persons who got a work-anxiety diagnosis were asked to fill in the additional questionnaire. Questionnaires were returned by 122 participants. Full socio-medical data could be obtained from 103 participants. The participants were on average 49.95 years old (*SD* = 8.4, range 24-63), 51.5% were women. Two thirds of them (59.4%) had a general mental disorder according to DSM-criteria (MINI *International neuropsychiatric Interview*, Sheehan et al., 1994), beside the acute work-anxiety. Concerning professional education status, 71.7% had completed an apprenticeship, 2.7% had a foreman qualification, 21.1% had a university degree, 3.5% had no completed professional education. Concerning their employment status, 8.0% were unskilled

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workers, 17.7% were employed blue-collar workers, 46.0% were white collar employees without leading position, 18.6% were white collar workers with leading position, and 2.7% were high qualified leading employees, 7.1% were self-employed. 86 participants were presently obtaining a workplace. We included persons who were presently unemployed, because for all persons in working age sick leave processes are relevant and underlie the same basic principle[4].

As compared to the present employment situation in the German working population according to the microcensus, which in 2012 counted 6.0% civil servants, 68.1% employees, and 25.9% blue collar workers (Destatis, 2013), our sample comes near to the German working population regarding basic work-demographics: Most of study participants were employees, a smaller part were blue-collar workers. Persons with work-anxiety reflect the range of the working population (Muschalla & Linden, 2013), and work-anxiety is not limited to a specific group, e.g. persons with low education or specific professional groups. A wish or application for disability pension was expressed by 11.5% of our sample, and 23.9% had a medically certified impairment according to German Social Law. Over the half of the participants (62.8%) had been on sick leave during the past 12 months and 87.5% had been on sick leave before coming into rehabilitation. The average sick leave duration in the past 12 months before rehabilitation was 6.76 weeks with wide variation (*SD* = 11.2 range 0–52 weeks).

Measures

[4] Sick leave has to be judged medically: Can a person do his/her present job (in case a person is employed), or a job on the general labor market that fits the persons´ abilities and considers earlier professional experience (in case the person is presently unemployed)? Sick leave decisions are always individual and must be based on the persons´ work ability and job type (thus a person-role-fit, French, 1973), but may be influenced by subjective ideas of the person (as reviewed above, e.g. Nieuwenhuijsen et al., 2013; Ekberg et al., 2014). The present or last workplace situation is the appropriate frame of reference for future developments: the present or last workplace situation is cognitively present, can be activated by means of cognitive rehearsal (instruction: “Please think of your (last) workplace”) and is more relevant for future sick leave development than general abstract work attitudes (Muschalla & Linden, 2013).

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Diagnostic of work-anxiety for study inclusion. The diagnosis of work-anxiety was done stepped, with a screening covering general aspects of work-anxiety (nine prototypical items of the *Job-Anxiety Scale*, Muschalla & Linden, 2013; Muschalla et al., 2013), followed by the structured *Work-Anxiety-Interview* (WAI, Muschalla & Linden, 2009; 2013). The WAI interview covers different psychopathological work-anxiety qualities, i.e. situational anxiety, hypochondriac anxiety, social anxieties, anxiety of insufficiency, general worrying, adjustment disorder and workplace phobia. The interview was validated in several studies with different anxiety questionnaires and psychopathology scales as measures for convergent and divergent validity (Muschalla & Linden, 2013). The inter-rater reliability was kappa = .97 (N = 106). The *Work-Anxiety-Interview* was additionally validated with the established *MINI International Neuropsychiatric Interview* (MINI, Sheehan et al., 1995; Linden & Muschalla, 2007). The WAI has been proofed to be able to differentiate between work-anxiety and general anxiety disorders: e.g., 40.9% from psychosomatic patients have general anxiety disorders, 10% general anxiety disorder and specific workplace phobia, 5.7% only workplace phobia, 43.5% no anxiety disorder at all (Muschalla & Linden, 2009). Persons with a work-anxiety diagnosis are scoring higher in self-rated work-anxiety than persons with general anxiety disorders, but not higher in general psychosomatic symptom load (Muschalla & Linden, 2009, 2013). Participants included in the present study had to fulfill criteria of at least one work-anxiety diagnosis according to *Work-Anxiety-Interview*. This is necessary for assuring that the work-anxiety is practically meaningful, and for assuring that study participants correspond to typical work-anxiety persons whom we find in occupational and clinical reality, and for assuring that we do not transport an inflating meaning of work-anxiety.

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Workplace perception. The *Short Questionnaire for Work Analysis* (original KFZA, Prümper et al., 1995) contains 26 items on 11 dimensions: perceived scope of action (3 items), variability (3 items), holistic job (2 items), social support (3 items), need for cooperation with colleagues and superiors (3 items), qualitative stress concerning the tasks (2 items), quantitative stress (2 items), situational constraints like lack of information or interruptions (2 items), environmental stress, i.e. awkward physical working conditions (2 items), possibilities for information and participation (2 items), benefits and possibility for personal development (2 items). Rating is done from (1) no agreement to (5) full agreement for each item. Participants were asked to refer to their present (in case of employed part-time or fulltime) or past (in case of unemployed) workplace situation.

Prognosis of work ability. Physicians judged the *work ability prognosis* in the end of the three-week rehabilitation, independently from the study psychotherapists´ work ability impairment rating. According to the standards in German rehabilitation medicine, physicians gave a prognosis on the general work ability in terms of the amount of possible working hours per day: 0 = under 3 hours per day, 3 = 3-6 hours per day, 6 = 6 or more hours per day.

Work ability impairment rating. The socio-medically trained state-licensed psychotherapist gave an observer-rating on the patient´s *work ability impairment* according to the internationally evaluated work ability impairment rating *Mini-ICF-APP* (Linden, Baron, & Muschalla, 2009; Molodynski et al., 2013). The Mini-ICF-APP has become a recommended instrument in socio-medical work ability description practice (DRV, 2012; SGVP, 2012). The Mini-ICF-APP covers thirteen dimensions of work-relevant psychological abilities which are often impaired due to mental disorders: Adherence to regulations, planning and structuring of tasks, flexibility, applying expertise, capacity to judge and decide, endurance, assertiveness, contacts with others, teamwork capacity, self-care, mobility, recreational activities, and dyadic interaction. The impairment rating was

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done after collecting information on the work context and respective work demands, as well as illness-related impairments concerning these work demands, in a half-structured interview (Linden et al., 2009, 2015). A global score can be calculated as a marker of overall work ability impairment. The impairment degree for each dimension are defined as follows: 0 = *no impairment*, 1 = *mild impairment*, i.e. there are some difficulties for the person to fulfill the work demands but there are no negative consequences for the work or others, 2 = *relevant impairment*, i.e. there are visible problems in fulfilling the work demands, colleagues can see that there are problems (e.g. nervousness, little mistakes), 3 = *severe impairment*, i.e. help from others (colleagues, supervisor) is needed regularly to fulfill the work demands and activities that the person should have done, 4 = *full impairment*, i.e. no respective work activity is possible, complete dispensation from the task is necessary. The rating is a clinical expert rating, i.e. the interviewer has to rate the degree of impairments based on his observation and the information on work ability impairment explored from the patient. Therefore the interview questions must be posed precisely behavior-oriented in order to get the relevant information on work *ability impairment* (instead of *wellbeing impairment*) from the patient. The rater in this study is a state licensed psychotherapist with ten years of expertise in psychosomatic rehabilitation diagnostic and socio-medical work ability exploration and description. A trained psychological co-rater assisted in a part of the interviews (n = 46) for proving inter-rater-reliability. The inter-rater reliability of the capacity impairment ratings from the interviewer and the co-rater in this study was between r = .706 (endurance) and r = .940 (mobility).

Data analyses

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Data were analysed with SPSS version 23. Table 2 shows the bivariate Spearman correlation of the study variables and Cronbachs alphas of the KFZA dimensions. Table 3 presents means, standard deviations or frequencies for persons with longer and shorter sick leave duration within six months after rehabilitation. We tested the predictive values of the workplace perception for sick leave duration with linear regression analysis (Table 4). Therefore the independent interval variables were transformed into z-scores. The dichotomous variable gender was coded 0 (male) and 1 (female). Regression analysis was conducted in three steps. The first step included the unchangeable variables age, gender, sick leave duration in the past 12 months. The second step contained the socio-medical work ability judgment (physicians work ability prognosis and work ability impairment). In the third step, the workplace perception (KFZA dimensions) was added in order to find out about its additional explanatory value for sick leave duration. Due to low internal consistency reliability (Cronbachs alpha <.600), four KFZA subscales have been deleted from the regression analyses (Table 4).

The sample size for regression analysis depends on the expected effect. The interest here is to detect a middle to large effect, because a large (but not a small) effect is relevant in practice. According to statisticians´ advice (Cohen, 1988, cited with Field, 2013), a sample size of $n = 77$ is appropriate for regression analysis with up to 20 predictors in case a large effect is expected to be detected. For judging effects, $R^2 = .020$ means a small effect, $R^2 = .130$ medium effect, $R^2 = .260$ large effect (Cohen, 1988, cited with Field, 2013).

Results

Table 2 shows the bivariate Spearman correlations between the study variables. Correlations are small to medium size, and to a great part not

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significant. Therefore there is no serious problem of multicollinearity. The inter-correlations of the KFZA dimensions range between .002 and .530**. Only three out of 55 bivariate correlations are above .500. More than half (n = 29) of the KFZA-inter-correlations are not significant. Cronbachs alphas of the eleven KFZA dimensions range between .439 to .838, which is better than in the original study (.40 to .76, Prümper et al., 1995). But, due to their relatively low internal consistency, four KFZA-dimensions with Cronbachs alpha <.600 are excluded from regression analysis in this present study (Table 4).

[insert table 2 about here]

Table 3 shows the comparisons of participants with longer (13 weeks or longer) and shorter (less than 13 weeks[5]) sick leave duration after rehabilitation. The only difference between the two groups concerns the work ability aspects: Persons with longer sick leave duration after rehabilitation were seen less able to work longer hours than persons who later have a shorter sick leave duration. Persons with longer sick leave durations also had higher work ability impairment in the socio-medical observer-rating Mini-ICF-APP. Persons with longer and persons with shorter sick leave had a similar level of workplace perception over all KFZA dimensions.

[insert table 3 about here]

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Taking into consideration the essential medical sick leave predictors (prognosis/work ability impairment) in the regression model (Table 4, Step 2), then especially a higher work ability impairment (Mini-ICF-APP) played a significant role ($p < .000$, $p = .001$) for explaining longer sick leave duration six months after rehabilitation.

[insert table 4 about here]

When additionally considering the KFZA dimensions in the regression model (Step 3, included are KFZA dimensions with Cronbach´s alpha >.60), we can see that subjective workplace perception (KFZA) was - beyond the hard medical criteria of observable work ability impairment and physicians prognosis - additionally explanative for sick leave duration: While the medical aspects (physicians prognosis and work ability impairment) already showed a relevant effect in variance explanation ($R^2 = .171, .178$, corresponding to Cohen (1988) a middle effect), the effect when considering the KFZA dimensions was high and therefore workplace perception of further relevance ($R^2 = .305, .312$ with significant change in F of $p = .035$, marginally significant change of F in $p = .093$).

Three out of seven KFZA dimensions appeared statistically significant in variance explanation for future sick leave duration. Two dimensions cover job resource aspects (scope of action, negative association with sick leave; social support, positive association with sick leave), and one dimension reflects an aspect of job demands (need for cooperation, negative association with sick

[5] In neurological rehabilitation, on average 12-13 weeks are the normal time frame until return to work. Thus, 13

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leave).

Discussion

This is the first study to investigate the relative predictive values of workplace perception for later sick leave duration in persons with work anxiety. Based on the conceptual framework of sick leave as a result from work ability impairment and workplace (Lederer et al., 2014), and based on findings from earlier empirical research (Arends et al., 2010; Gatchel et al., 1994; Hatchard et al., 2012; Linden et al., 2010; Nielsen et al., 2013), we investigated the relative importance of the medical predictors and workplace perception. Results show that in persons with work-anxiety sick leave duration is a result from illness-related impairment, i.e. *work ability impairment* and *prognosis*, but is also partly influenced by *workplace perception*.

In this study, the influence of the past sick leave duration, which has been proofed in many studies (Cornelius et al., 2011, Dekkers-Sánchez, Hoving, Sluiter, & Frings-Dresen 2008; Hees, Koeter, & Schene, 2012; Koopmanns et al., 2010, 2011; Linden et al., 2009, 2015) could not be found. An explanation could be that a part of the investigated sample (30%) did not have an underlying general mental disorder (which is often connected with longer sick leave in the past) and therefore there is no history of longer sick leave in the past 12 months.

Stronger *work ability impairment* instead was very clearly predictive for future longer sick leave duration, which corresponds to the literature: it was for example found that work performance was rather related to work ability than to

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weeks was chosen here as the cutoff.

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general work attitude (Linden et al., 2010).

Concerning the explorative question on the meaning of *workplace perception*, in this study job resources (scope of action) as well as job demand (need for cooperation) were negatively associated with sick leave duration. Other research shows that perceived job control (a job resource, similar to the here investigated KFZA dimension scope of action) is a relevant cognitive aspect for facilitating return to work (Gragnano, Negrii, Miglioretti, & Corbiere, 2017). Furthermore, a distinction was suggested into factors promoting excellent work ability and factors preventing poor work ability (Lindberg, Josephson, Alfredsson, & Vingard, 2017). Research shows that job security and psychosocial factors are important to ensure work ability and prevent sick leave drop outs (Lindberg et al., 2017). Interestingly, in our study with the work-anxiety persons, there was a positive relation between perceived social support and sick leave duration, and a similar finding for variability. An explanation may be that social support makes it easier for work-anxiety persons to continue sick leave, because they feel well supported even in case of illness (they can allow to be some more days off from work). Another explication may be that social support (and also variability) may mean demands for persons with work-anxieties, and are rather avoided, which presents in longer sick leave duration.

In our work-anxiety persons at risk for sick leave, especially preventing poor work ability is of relevance. In the literature it is clearly described that early efforts for return-to-work are necessary in case of illness absence (Nash-Wright, 2011). Taking into consideration results from this presents and other studies, strengthening *positive workplace perception,* such as *job resources* (social support, scope of action) might be a step to encourage return to work in persons

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with work-anxiety. As a higher control and coping perception may contribute to reducing anxiety (Christianson et al., 2011), sick listed employees who potentially suffer from work-anxiety should be asked for their workplace perception (instead of asking for “feelings”, ”symptoms” or “work-anxiety”) in return to work consultations. In case the person has a rather negative workplace perception (e.g. low scope of action), this could be changed by means of cognitive restructuring, even without targeting the more problematic topic “work-anxiety”. Focusing on workplace aspects might be done by questions like “What may be positive in your work situation? In which aspects do you find control and influence?”

Beside cognitive restructuring, there may also be a work-condition-directed mental hazard assessment of the work as such (e.g. outlined in Rau, 2010) in employees on sick leave due to work-anxiety problems (Linden & Muschalla, 2013). By a thorough investigation of workplace and person it can be decided in each single case whether a person-intervention or a workplace intervention is senseful. In case more than half of the employees who do the same work complain about specific work characteristics, e.g. low scope of action, there might be a problem with the workplace as such (not with the persons doing the work) and therefore not a cognitive restructuring, but a work adjustment is necessary. On the other hand, in case only one employee out of ten doing the same work complains, the scope of action must not be bad in general, but the problem may be in the person (work-anxiety), or in a person-job/role-misfit (French, 1973) which may also be accompanied with work-anxiety (Muschalla & Linden, 2013).

In occupational practice, the question is, whether a person- or a

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workplace-oriented intervention is adequate in a single case. This can be found out within a vocational reintegration management (in German social law § 84 SGB IX), by considering expertise of both work psychologist (expert for work design and human workplace perception and work behavior) and work occupational physician (expert for the type of illness and its interaction with work demands). Some companies install psychosomatic counseling services which focus questions of work ability in case of mental health and work-anxiety problems (Rothermund et al., 2016).

Limitations and strengths of the present study

Workplace aspects are based on self-reports in this study, and therefore do not reflect the objective work situation but the individual workplace perception. However, the question of research here *requires self-reports*, as the individual perception of return-to-work-relevant aspects has been shown to be best predictive for real return-to-work (Berglind & Gerner, 2002, Heijbel et al., 2006). In other research on psychopathology and illness-related impairment in all-day activities, it has been shown that self- and observer-rating are only partly differing: The participants usually rate themselves as more impaired than the observer (e.g., physician) does, but, concerning the quality of impairment, there is congruence between self-report and observer-rating (Linden et al., 2012). Similar, in work research also partly agreement and disagreement between self- and expert-rating has been found: both expert-rated and self-rated job demands were related to depression, but expert-rated job control was not related to depression (Rau, Morling, & Rösler, 2010).

Another potential limitation may be that in the follow-up time there might

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have been changes in illness status, or work status which all may potentially influence the further sick leave development. In this study, we focused on the data which are relevant at the time of investigation. As we investigated a heterogeneous sample with the specific common characteristic work-anxiety, potential additional influences during follow-up may be of very different nature in each single case. Thus, no complete detection of additional influences is possible. Even if we had assessed workplace perception (operationalised with KFZA) at the time of follow-up, we could not conclude anything about objective (changes) on workplace characteristics, because data are subjective.

The data of this study are not suitable to test for causal hypotheses concerning the psychological mechanism between the predictor variables, because all predictor variables have been assessed at the same time. The aim of the study is not to test for causalities, but describe which aspects (work ability and workplace perception) are of relevance for later sick leave development in work-anxiety. From the data, we cannot say whether difficult working conditions lead to work-anxiety or work-anxiety leads to a negative workplace perception. From clinical cases and established models of anxiety psychology (event-related learned anxiety versus general anxiety predisposition), we know that both directions of development are possible (Muschalla & Linden, 2013).

Strengths of the study are its longitudinal design and that we used multi-source data. Physicians of the somatic indication were involved giving independent work ability prognosis. Additionally, a thorough interview was done by a state-licensed psychotherapist with ten years of expertise in socio-medical examination and work ability description with the standardized Mini-ICF-APP-instrument.

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The outcome was a hard criterion, i.e. sick leave duration six months after treatment. We approached the relevant target persons with work-anxieties in the very situation when being confronted acutely with return to work – either their existing workplace or a similar on the labour market. Thereby participants´ perception of a concrete reference workplace was focused. This induces a quite lively workplace perception and not abstract ideas such as general work attitude, which is not of relevance (Linden et al., 2010).

Another strength of this study is that we approached a heterogeneous ecologically valid sample, which is required for such an observational study. The sample included persons with work-anxiety from different education and job levels, employed or presently unemployed. We thus do not focus an artificially selected sample (e.g. only employed persons) but the phenomenon as occurring in reality: Practitioners in companies and job centers are working with such persons every day. The core common characteristic is practically relevant work-anxiety, and the question was whether these persons´ perception of their present or last workplace influences the further sick leave development. The study shows that it does.

Suggestions for Future Research, Practical Implications and Conclusions

From a methodological perspective, future studies should consider work description scales with stable intern consistencies >.600.

Since this present study focused on persons with work-anxiety, comparative analyses of persons with and without work-anxiety are now needed. Our data give some hints which research questions could be posed next: Why is social support and (marginally) variability perception positively associated with

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sick leave duration in work-anxiety persons? Normally, social support and variability are known as resources which may be associated with return to work. Do persons with work-anxiety have different psychological functioning, which makes classical resources not seen as resources, but as demands, and thus not support return to work? To find out whether the same regression model applies for persons with and without work-anxiety will be important for practical implications. The question is which recommendations (e.g. modifying aspects of workplace perception, adjustment of workplace conditions) apply for which persons (with or without work-anxiety).

In practice, return-to-work processes in work-anxiety employees may take into consideration the workplace perception and strengthen job resource perception (e.g. scope of action), and reduce perceptions of situational constraints at work. Interventions for work-anxiety persons might – beside training work-specific coping, self-efficacy or proactive *work-behavior* (Frese & Fay, 2000; Linden, Muschalla, Hansmeier, & Sandner, 2013) – also focus on modifying *workplace perception*. Considering the job-demand-control approach (e.g. like Silva-Junior & Fischer, 2014), it might be investigated whether cognitions of ones workplace situation can be changed, and whether people who are able to perceive job resources and see their work load as manageable might more easily overcome anxiety-related avoidance and sick leave.

The outcome of work-directed interventions is rather inconsistent until now (Braathen, Veiersted, & Heggenes, 2007; Martin et al., 2013; Noordik et al., 2012, Rebergen, Bruinvels, Bos, van der Beek, & van Mechelen, 2010; Soogard & Bech, 2009; Van der Feltz-Cornelis, Meeuwissen, de Jong, Hoedeman, & Elfeddali, 2007; Vlasfeld et al., 2013; Wahlin, Ekberg, Persson, Bernfort, &

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Oberg, 2012; Winslow et al., 2016). Some controlled trials found that treatments focusing on work-directed self-efficacy or early reintegration, do not always lead to faster return to work. Future research should take into account the relevant psychological sick leave predictors, including work-anxiety and job resource perception when conceptualizing interventions outside the workplace (Muschalla & Linden, 2009; Wahlin et al., 2012, Noordik et al., 2012), or preventive interventions at the workplace (Frese & Fay, 2000, Linden et al., 2013).

Doing the first step for return to work in case of work-anxiety may be done not only on the behavioral level, i.e. with capacity training, but by means of modification of dysfunctional cognitions towards work – e.g. beginning with perceived job resources. A first short-intervention study showed that modifying workplace perception is not easy (Muschalla, 2016), but further research might explore variants: e.g. modifying workplace perception by behavior therapeutic means of cognitive reframing may be accompanied by (temporary) workplace adjustment.

Conflicts of interest:

The author declares that she has no conflicts of interest.

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Ethics considerations and ethical approval:

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All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000.

Written informed consent was obtained from all participants for being included in the study.

This study was conducted with the approval of the Ethics Committee of the University of Potsdam, Germany, and approval of the department of data protection of the German Federal Pension Fund.

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Table 1.
Study design and measures

Rehabilitation center		Six months after end of rehabilitation, study participants are contacted again in their allday life
Screening interview on work-anxiety by socio-medical study psychotherapist Blinded inclusion criterion for further study participation: patients answer at least two out of nine work-anxiety screening items positively, i.e. they suffer from two aspects of work-anxiety (*Job-Anxiety-Scale*, Muschalla & Linden, 2013)	In depth interview with participants fulfilling the inclusion criteria: *Work-Anxiety-Interview* (Linden & Muschalla, 2007) and work ability interview (*Mini-ICF-APP*, Linden et al., 2009) by socio-medical study psychotherapist Participants fill in the *Short Questionnaire for Work Analysis* (KFZA, Prümper et al., 1995) Physicians give standardized medical prognosis on participants´ general work ability (independent judgment) in work hours: 0 = under 3 hours per day 3 = 3-6 hours per day 6 = 6 or more hours per day	Cumulated *duration of sick leave within the past six months* (i.e. during the time after rehabilitation)

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Table 2.
Bivariate Spearman correlations between all study variables

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
1.Gender																
2.Age	.020															
3.Sick leave 12 months	.143	-.028														
4.Mental work ability impairment	.164	-.099	.128													
5.Prognosis working hours	-.246*	.178	-.055	-.221*												
6.Scope of action	-.354**	.168	-.162	-.192	.058	*.838*										
7.Variability	-.213*	.190	-.114	-.162	.190	.415**	*.626*									
8.Holistic job	-.013	.050	-.162	-.112	.217*	.319**	.455**	***.512***								
9.Social support	-.011	.012	-.099	-.288**	.133	.254*	.158	.320**	***.815***							
10.Need for cooperation	-.098	-.008	-.140	-.080	.156	.260*	.265**	.334**	.530**	***.620***						
11.Qualitative stress	.001	.146	.010	.215*	-.114	-.061	.227*	-.066	-.208*	-.041	***.439***					
12.Quantitative stress	-.065	-.003	-.131	.081	.161	.002	.121	.019	-.171	.030	.440**	***.748***				
13.Interruptions/situational constraints	-.027	.020	-.043	.166	.076	.022	.154	-.101	-.319**	-.018	.321**	.466**	***.567***			
14.Environmental stress	-.239*	-.119	.182	.108	-.128	-.084	-.016	-.153	-.141	-.074	.104	.147	.173	***.519***		
15.Information participation	-.097	.017	-.189	-.151	.018	.348**	.090	.249*	.516**	.523**	-.142	-.158	-.378**	-.151	***.710***	
16.Benefits development	.188	.040	-.240*	-.156	.073	.304**	.187	.247*	.425**	.375**	-.015	.010	-.097	-.295**	.470**	***.664***

Note: **p*<.05, ***p*<.01. Entries are standardized regression coefficients. Coding of categorical variables is as follows: Gender: 0 = male, 1= female. Physicians prognosis of general work ability in work hours: 0= under 3 hours per day, 3 = 3-6 hours per day, 6 = 6 or more hours per day. ***Cronbachs alphas of the KFZA dimensions in the diagonal.***

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Table 3.
Characteristics of persons with shorter and longer sick leave duration six months after rehabilitation

	Sick leave duration after rehabilitation 0-under 13 weeks *max. n* = 52		Sick leave duration after rehabilitation 13 weeks or longer *max. n* = 51		Signifi-cance of group difference *p*
	n	%	*n*	%	
Gender: Female	27	52	26	51	.713
	M	*SD*	*M*	*SD*	
Age	49.63	8.52	50.24	8.45	.720
Sick leave duration in past 12 months	5.79	10.79	7.76	11.64	.374
Prognosis: Quantity of work ability (hours per day)	5.65	1.14	4.84	2.36	.027
Work capacity impairment Mini-ICF-APP (0-4)	0.69	0.36	1.02	0.58	.001
Workplace perception variables (KFZA)					
Scope of action (1-5)	2.29	1.23	2.02	1.23	.264
Variability (1-5)	2.67	0.96	2.71	1.04	.867
Holistic job (1-5)	2.54	1.18	2.58	1.17	.893
Social support (1-5)	2.30	1.18	2.32	1.04	.942
Need for cooperation (1-5)	2.56	0.94	2.35	1.05	.293
Qualitative stress (1-5)	1.50	1.10	1.63	1.02	.535
Quantitative stress (1-5)	2.98	1.04	2.62	1.17	.101
Interruptions/situational constraints (1-5)	1.89	1.01	2.18	1.20	.226
Environmental stress (physical working conditions) (1-5)	1.45	1.27	1.76	1.11	.198
Information and participation (1-5)	1.95	0.96	2.72	1.09	.662
Benefits or possibilities for development (1-5)	1.77	1.04	2.05	1.24	.165

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Table 4.

Linear regression analysis of sick leave predictors with sick leave duration (in weeks) six months after rehabilitation as dependent variable

Variables	Sick leave duration six months after rehabilitation *employed and unemployed participants*						Sick leave duration six months after rehabilitation *only employed participants* (n = 79)					
	Step 1		Step 2		Step 3		Step 1		Step 2		Step 3	
	Beta	*p* Value	Beta	*p* Value	Beta	*p* Value	Beta	*p* Value	Beta	*p* Value	Beta	*p* Value
Control variables												
Gender	.032	.761	-.057	.567	-.144	.205	.080	.493	-.020	.860	-.130	.312
Age	.043	.678	.086	.377	.087	.373	.154	.183	.184	.091	.138	.208
Sick leave duration in the past 12 months in weeks	.148	.156	.131	.180	.124	.196	.017	.885	.013	.907	.051	.643
Socio-medical work ability judgment												
Impairment in mental work ability (Mini-ICF-APP interviewer rating)			.318	.002	.262	.000			.300	.008	.373	.001
Physicians prognosis: quantity of work ability in work hours per day			-.158	.130	-.165	.131			-.195	.085	-.224	.051
Workplace Perception (KFZA)												
Scope of action				.	-.291	.019					-.266	.046
Variability					.207	.056					.217	.071
Social support					.261	.035					.294	.031
(Need for) cooperation					-.305	.013					-.278	.048
Quantitative stress					-.041	.675					-.047	.667
Information and participation					.131	.300					.149	.303
Benefits or possibilities for development					-.054	.650					-.032	.808
R^2	.027		.171		.305		.034		.178		.312	
corrected R^2	-.005		.125		.204		-.005		.121		.187	
R^2 change	.027		.144		.134		.034		.144		.135	
Sig. change in F	.475		.001		.035		.458		.003		.093	

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Entries are standardized regression coefficients. Coding of categorical variables is as follows: Gender: 0 = male, 1= female. Physicians prognosis of work ability in work hours: 0= under 3 hours per day, 3 = 3-6 hours per day, 6 = 6 or more hours per day.

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